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REVIEWS

Handbook for Field Geologists. By C. W. HAYES, PH.D., Chief Geologist U. S. Geological Survey. Pp. 159; 18 figures. New York: John Wiley & Sons, 1909.

This handbook of field methods will be found an important addition to the equipment of the working geologist. The basis of the present book was laid in an earlier volume on geologic field methods issued modestly in a limited edition in 1908 merely for distribution among members of the U. S. Geological Survey, but the frequency with which requests were made for it from members of the state surveys, teachers, mining geologists, and others indicated that a much wider need for such a book was felt, and it was in response to this demand that the present volume has been prepared.

The subject is treated under two main heads—Part I, general instructions, and Part II, instructions for special investigations. Part I covers the more common matters and the more specific instructions to members of the U. S. Geological Survey. Among these are included the field outfit, the more general lines of field observations, and measurements of structural features. These are accompanied by tables and formulas, and by the many graphic and trigonometric aids in solving problems connected with folds, faults, thickness of beds, etc. Upon these subjects much information is given in a condensed form. The taking of notes receives special attention; the purposes and the technique not only of written notes, but of graphic, photographic, traverse, plane table and profile notes, are carefully treated in detail and much attention is devoted to the methods of collecting material for further study and for museum exhibition. The various methods of surveying are also given an important place. The chief emphasis in this part is placed upon the necessity of using sound, accurate, and systematic methods in field work. It is an excellent exposition of the mechanical devices which have been long tried and found serviceable by the Federal Survey and, while doubtless not the last word, may be accepted as the teachings of mature experience.

Part II serves as a guidebook to the significant features to be observed in various special branches of field investigation and in its nature could not be equally complete. Pointers are given for the description and interpretation of land forms, for observations in petrologic and structural geology, for the study of glacial formations, and for the investigation of metalliferous deposits. These discussions are followed by formal schedules or synopses upon fourteen special topics, such as, e.g., No. 4, Glaciers and glacial deposits; No. 14, Oil and gas. In these the salient features to be noted in the field are arranged in tabular form so as to be suggestive and directive to geologists, especially when working in lines outside their own special fields.

The book closes with an appendix giving a list of the official surveys of the United States, Canada, and Mexico, and the 33 states which conduct such surveys, together with the names of their directors in 1909 and an indication of the extent of their publications.

The booklet, strongly bound in flexible leather, is given a size convenient for use in the field and will be a welcome companion of many a working geologist.

R. T. C.

Geologie der Steinkohlenlager. VON DANNENBERG. Erster Teil, pp. 197, with 25 figures. Berlin: Gebrüder Borntraeger, 1909.

This work is a critical treatise upon the coal-bearing formations of Central Europe in which much attention is given to questions pertaining to the mode of origin of the coal and to the relation between the tectonics of the regions and the character of the coal. The stages in the development of the coals from the original vegetal matter through bacterial action, deformative movements of the strata, and igneous intrusions are carefully treated. Under the head of climatic and atmospheric conditions of the Carboniferous, the author discusses the older hypotheses of a heavy atmosphere, rich in carbon dioxide, and the newer view of an atmosphere with a limited fluctuating carbon dioxide content depending upon many factors. A close relation between extensive coal deposits and periods of unusual vulcanism which might be supposed to furnish the necessary carbon dioxide for the plant growth is sought, but no very apparent relation between the two is found. The Carboniferous was not preceded by any very unusual volcanic activity. To supply the carbon for the Coal Measures one would have to look back to the Devonian igneous activity. But in this discussion the author apparently fails to make use of the fact which he recognizes, namely, that much more carbon dioxide enters into the formation of limestone than is stored away in coal deposits. When it is considered that the atmosphere has been steadily contributing carbon dioxide to extensive limestone development throughout most of the sedimentary geologic history, the storage of carbon in coal beds at certain horizons in the Carboniferous, Cretaceous, Tertiary, etc., becomes less exceptional in its